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3/02

ROY F. WESTON, INC.

REMOVAL PROGRAM QUALITY ASSURANCE
SITE SPECIFIC- HEALTH AND SAFETY PLAN

PHASE II
DOWNER'S GROVE GROUNDWATER INVESTIGATION
DOWNERS GROVE, ILLINOIS

MARCH 2002

WESTON

REMOVAL PROGRAM QUALITY ASSURANCE
SITE SPECIFIC- HEALTH AND SAFETY PLAN

PHASE II
DOWNER'S GROVE GROUNDWATER INVESTIGATION
DOWNERS GROVE, ILLINOIS

MARCH 2002

Prepared For:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Emergency and Enforcement Response Branch
77 West Jackson Boulevard
Chicago, Illinois 60604

TDD No. 0111-010
Document Control No. 195-2D-ABOO

Approvals:

Steve Faryan **Date**	**Om Patel** For **Date**
On-Scene Coordinator	**START Project Manager**

SITE HEALTH AND SAFETY PLAN (HASP) FORM 1

Prepared by: Ben Maradkel

W.O. Number: 12634-001-001-0195-00 **Date:** 3/29/02

Project Identification

Office: Chicago
Site Name: Downers Grove Site
Client: U.S. EPA
Work Location Address: Ellsworth Industrial Park
Downers Grove, IL

Site History: IEPA conducted a ground water investigation in the spring of 2001. The investigation, which included several private well samples, resulted identifying chlorinated solvent compounds in the ground water. U.S. EPA conducted a ground water investigation in March 2002. The results identified TCE/PCE near facilities listed below.

Scope of Work:
Perform a site assessment on Rexnord, Arrow Gear, Scott, Dynagear, Precision, Ames and St. Joseph Creek, which are located in Ellsworth Industrial Park, Downer's Grove, Illinois. The site assessment will include groundwater sampling (approx. 50), subsurface soil sampling (approx. 100), sediment sampling (approx. 16), installation of overburden and bedrock wells, utility clearances, marking of drilling/sampling locations and GPS activities. The HAS Soil Boring and well installation will be utilized by WESTON subcontractor. Geoprobe/MIP Boring will be utilized by IEPA. U.S. EPA will utilize GPS activities and OSC will conduct overall oversight. WESTON/START will conduct oversight, photo/written documentation, air monitoring, sampling and marking of locations.

☐ Sites visit only; site HASP not necessary. List personnel here and sign off below:

Regulatory Status:

Site regulatory status:

CERCLA/SARA	RCRA	Other Federal Agency
☒ U.S. EPA	☐ U.S. EPA	☐ DOE
☒ State	☐ State	☐ USACE
☐ NPL Site	NRC	☐ Air Force
☒ OSHA	☐ 10 CFR 20	☐ _____

Hazard Communication (Req'd See Attachment D)
☒ 1910 ☒ 1926 ☐ State

Safety Officer Manual (Required to be On-Site)
Based on the Hazard Assessment and Regulatory Status, determine the Standard HASP(s) applicable to this project. Indicate below which Standard HASP will be used and append the appropriate pages of this form along with the Standard Plan.

☐ Stack Test	☐ _____
☐ Air Emissions	☐ _____
☐ Asbestos	☐ _____
☐ Industrial Hygiene	☐ _____
☐ _____	☐ _____

Review and Approval Documentation:

Reviewed by:
SO/DSM/CHS — Ronald Bugg (Name Print) — [signature] (Signature) — Date: 4/1/02

Other — _____ (Name Print) — _____ (Signature) — Date: _____

Approved by:
Project Manager — for Om Patel (Name Print) — [signature] (Signature) — Date: 4/1/02

Hazard Assessment and Equipment Selection:

In accordance with WESTON's Personal Protective Equipment Program and 29 CFR 1910.132, at the site prior to personnel beginning work, the SHSC and/or the Site Manager have evaluated conditions and verified that the personal protective equipment selection outlined within this HASP is appropriate for the hazards known or expected to exist. (Refer to Safety Officer Manual Section 2, Personal Protection Program, for guidance.)

☒ SHSC ☐ Site Manager — Ben Maradkel (Name Print) — [signature] (Signature) — Date 4/1/02

Project start date: 4/1/02 End date: 5/17/02	This site HASP **must** be **reissued/reapproved** for any activities conducted after: Date: 09/30/02	Amendment date(s) 1. 2. 3. 4. 5.	By: Ben Maradkel

WESTON REPRESENTATIVES-FORM 2

Organization/Branch	Name/Title	Address	Telephone
Vernon Hills office	Om Patel	750 East Bunker Court Vernon Hills, IL 60061-1450	847/ 918-4051
Chicago Office	Ben Maradkel	70 West Madison Chicago, IL 60602	312/ 424-3314
Vernon Hills office	Kurt Fischer	750 East Bunker Court Vernon Hills, IL 60061-1450	847/ 918-4016

Roles and Responsibilities:
WESTON/START will conduct oversight, photo/written documentation, air monitoring, sampling and marking of locations.

WESTON SUBCONTRACTORS

Organization/Branch	Name/Title	Address	Telephone
TBD			

Roles and Responsibilities:

Will conduct HAS soil boring and monitoring well installation.

*Note: The Field/Site Supervisor shall be responsible for supervision of the Contractor and Lower Tier Subcontractor Personnel

SITE-SPECIFIC HEALTH AND SAFETY PERSONNEL

The Site Health and Safety Coordinator (SHSC) for activities to be conducted at this site is: Ben Maradkel

The SHSC has total responsibility for ensuring that the provisions of this Site HASP are adequate and implemented in the field.

Changing field conditions may require decisions to be made concerning adequate protection programs. Therefore, the personnel assigned as SHSCs are experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120.

Qualifications:
40-hour, 8-hour refresher, SHSC, Blood Borne, First Aid/CPR

Designated alternates include:
Om Patel

HEALTH AND SAFETY EVALUATION-FORM 3

Hazard Assessment

Background Review: ☒ Complete ☐ Partial If partial why?

Activities Covered Under This Plan:

No.	Task/Subtask	Description	Schedule
1		Ground Water Investigation/Sampling	4/15/02
2		Soil and Sediment Investigation/Sampling	4/15/02
3		Oversight	4/15/02
4		Well Installation	4/15/02

Types of Hazards:

1 Numbers refer to one of the following hazard evaluation forms. Complete hazard evaluation forms for each appropriate hazard class.

Physiochemical 1

- ☒ Flammable
- ☐ Explosive
- ☐ Corrosive
- ☒ Reactive
- ☐ O_2 Rich
- ☐ O_2 Deficient

Chemically Toxic 1

- ☒ Inhalation ☐ Carcinogen
- ☒ Ingestion ☐ Mutagen
- ☒ Contact ☐ Teratogen
- ☐ Absorption
- ☐ OSHA 1910.1000 Substance (Air Contaminants)
- ☐ OSHA Specific Hazard Substance Standard (Refer to following page for listing)

Radiation 3

Ionizing:

- ☐ Internal exposure
- ☐ External exposure

Non-ionizing:

- ☐ UV ☐ IR
- ☐ RF ☐ MicroW
- ☐ Laser

Biological 2

- ☒ Etiological Agent
- ☒ Other (plant, insect, animal)

- ☒ **Physical Hazards 4**
- ☒ Construction Activities

Source/Location of Contaminants and Hazardous Substances:

Directly Related to Tasks

- ☐ Air
- ☐ Other Surface
- ☒ Groundwater
- ☒ Soil
- ☐ Surface Water
- ☐ Sanitary Wastewater
- ☐ Process Wastewater
- ☒ Other Sediment

Indirectly Related to Tasks — Nearby Process(es) That Could Affect Team Members:

- ☐ Client Facility/WESTON Work Location
- ☐ Nearby Non-Client Facility

Describe:

- ☐ Have activities (task[s]) been coordinated with facility?

HEALTH AND SAFETY EVALUATION-CHEMICAL HAZARDS OF CONCERN-FORM 4

☐ N/A

Chemical Contaminants of Concern

Provide the data requested for chemical contaminants on HASP Form 25 or attach data sheets from an acceptable source such as NIOSH pocket guide, condensed chemical dictionary, ACGIH TLV booklet, etc. List chemicals and concentrations below and locate data sheets in Attachment B of this HASP.

Chemical Name	Concentration (If known)
TCE	1-300 ppb (water)
PCE	1-50 ppb (water)
TCE	5-250 ppm (soil/sediment)
PCE	5-250 ppm (soil/ sediment)
1,2 PCE	60 ppb
1,1,1 TCA	<10 ppb
Toluene	<10 ppb

☐ N/A

Identify hazardous materials used or on-site and attach Material Safety Data Sheets (MSDSs) for all reagent type chemicals, solutions, or other identified materials that in normal use in performing tasks related to this project could produce hazardous substances. Ensure that all subcontractors and other parties working nearby are informed of the presence of these chemicals and the location of the MSDSs. Obtain from subcontractors and other parties, lists of the hazardous materials they use or have on-site and identify location of the MSDSs here. List chemicals and quantities below and locate MSDSs in Attachment B of this HASP.

Chemical Name	Quantity
Alconox	1 quart
Fuel (Diesel)	5 gallons
Methanol	0.5 kg (17ds) calibration cylinder
Isobutylene	0.5 kg (17 ds)calibration cylinder
Hydrogen	2 kg (for FID)

OSHA-SPECIFIC HAZARDOUS SUBSTANCES

The following substances may require specific medical, training, or monitoring based on concentration or evaluation of risk. See the appropriate citation listed under 29 CFR 1910 or 1926 for additional information.

☐ 1910.1001 Asbestos
☐ 1910.1002 Coal tar pitch volatiles
☐ 1910.1003 4-Nitrobiphenyl, etc.
☐ 1910.1004 alpha-Naphthylamine
☐ 1910.1005 [Reserved]
☐ 1910.1006 Methyl chloromethyl ether
☐ 1910.1007 3,3'-Dichlorobenzidine (and its salts)
☐ 1910.1008 bis-Chloromethyl ether
☐ 1910.1009 beta-Naphthylamine
☐ 1910.1010 Benzidine
☐ 1910.1011 4-Aminodiphenyl
☐ 1910.1012 Ethyleneimine
☐ 1910.1013 beta-Propiolactone
☐ 1910.1014 2-Acetylaminofluorene
☐ 1910.1015 4-Dimethylaminoazobenzene
☐ 1910.1016 N-Nitrosodimethylamine
☐ 1910.1017 Vinyl chloride
☐ 1910.1018 Inorganic arsenic
☐ 1910.1025 Lead (Att. FLD# 46)
☐ 1910.1027 Cadmium
☐ 1910.1028 Benzene
☐ 1910.1029 Coke oven emissions
☐ 1910.1043 Cotton dust
☐ 1910.1044 1,2-Dibromo-3-chloropropane
☐ 1910.1045 Acrylonitrile
☐ 1910.1047 Ethylene oxide
☐ 1910.1048 Formaldehyde
☐ 1910.1050 Methylenedianiline
☐ 1910.1051 1,3 Butadiene
☐ 1910.1052 Methylene chloride

HEALTH AND SAFETY EVALUATION-2 BIOLOGICAL HAZARDS OF CONCERN-FORM 5

☒ Poisonous Plants (FLD 43)

Location/Task No(s).:

Source: ☐ Known ☒ Suspect

Route of Exposure: ☐ Inhalation ☐ Ingestion ☒ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☒ No

Immunization required: ☐ Yes ☒ No

☒ Insects (FLD 43)

Location/Task No(s).:

Source: ☐ Known ☐ Suspect

Route of Exposure: ☐ Inhalation ☐ Ingestion ☒ Contact ☒ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☒ No

Immunization required: ☐ Yes ☒ No

☒ Snakes, Reptiles (FLD 43)

Location/Task No(s).:

Source: ☐ Known ☒ Suspect

Route of Exposure: ☐ Inhalation ☐ Ingestion ☒ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☒ No

Immunization required: ☐ Yes ☒ No

☒ Animals (FLD 43)

Location/Task No(s).: Site/ All Tasks

Source: ☐ Known ☒ Suspect

Route of Exposure: ☐ Inhalation ☐ Ingestion ☒ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☒ No

Immunization required: ☐ Yes ☒ No

FLD 43 — WESTON Biohazard Field Operating Procedures: Att. OP ☐

☒ Sewage

Location/Task No(s).:

Source: ☐ Known ☒ Suspect

Route of Exposure: ☒ Inhalation ☒ Ingestion ☒ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☒ No

Immunization required: ☐ Yes ☒ No

Tetanus Vaccination within Past 10 yrs: ☐ Yes ☐ No

☒ Etiologic Agents (List)

Location/Task No(s).: Site/ All Tasks

Source: ☐ Known ☒ Suspect

Route of Exposure: ☐ Inhalation ☐ Ingestion ☒ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☒ No

Immunization required: ☐ Yes ☒ No

FLD 44 — WESTON Bloodborne Pathogens Exposure Control Plan – First Aid Procedures: Att. OP ☐

FLD 45 — WESTON Bloodborne Pathogens Exposure Control Plan – Working with Infectious Waste: Att. OP ☐

HEALTH AND SAFETY EVALUATION-4 PHYSICAL HAZARDS OF CONCERN-FORM 7

Phy. Haz. Cond.	Physical Hazard	Attach OP	WESTON OP Titles
Loud noise	Hearing loss/disruption of communication	☒	FLD01 - Noise Protection
Inclement weather	Rain/humidity/cold/ice/snow/lightning	☒	FLD02 - Inclement Weather
Steam heat stress	Burns/displaced oxygen/wet working surfaces	☐	FLD03 - Hot Process - Steam
Heat stress	Burns/hot surfaces/low pressure steam	☐	FLD04 - Hot Process - LT3
Ambient heat stress	Heat rash/cramps/exhaustion/heat stroke	☐	FLD05 - Heat Stress Prevention/Monitoring
Cold stress	Hypothermia/frostbite	☒	FLD06 - Cold Stress
Cold/wet	Trench/paddy/immersion foot/edema	☒	FLD07 - Wet Feet
Confined spaces	Falls/burns/drowning/engulfment/electrocution	☐	FLD08 - Confined Space Entry
Explosive vapors	Thermal burns/impaction/dismemberment	☐	FLD09 - Hot Work
Improper lifting	Back strain/abdomen/arm/leg muscle/joint injury	☒	FLD10 - Manual Lifting/Handling Heavy Objects
Uneven surfaces	Vehicle accidents/slips/trips/falls	☒	FLD11 - Rough Terrain
Poor housekeeping	Slips/trips/falls/punctures/cuts/fires	☒	FLD12 - Housekeeping
Structural integrity	Crushing/overhead hazards/compromised floors	☐	FLD13 - Structural Integrity
Hostile persons	Bodily injury	☐	FLD14 - Site Security
Remote area	Slips/trips/falls/back strain/communication	☒	FLD15 - Remote Area
Improper cyl. handling	Mechanical injury/fire/explosion/suffocation	☐	FLD16 - Pressure Systems - Compressed Gases
Water hazards	Poor visibility/entanglement/drowning/cold stress	☐	FLD17 - Diving
Water hazards	Drowning/heat/cold stress/hypothermia/falls	☐	FLD18 - Operation and Use of Boats
Water hazards	Drowning/frostbite/hypothermia/falls/electrocution	☐	FLD19 - Working Over Water
Vehicle hazards	Struck by vehicle/collision	☒	FLD20 - Traffic
Explosions	Explosion/fire/thermal burns	☒	FLD21 - Explosives
Moving mechanical parts	Crushing/pinch points/overhead hazards/electrocution	☒	FLD22 - Heavy Equipment Operation
Moving mech. parts	Overhead hazards/electrocution	☐	FLD23 - Cranes/Lifting Equipment Operation
Working at elevation	Overhead hazards/falls/electrocution	☐	FLD24 - Aerial Lifts/Manlifts
Working at elevation	Overhead hazards/falls/electrocution	☐	FLD25 - Working at Elevation
Working at elevation	Overhead hazards/falls/electrocution/slips	☐	FLD26 - Ladders
Working at elevation	Slips/trips/falls/overhead hazards	☐	FLD27 - Scaffolding
Trench cave-in	Crushing/falling/overhead hazards/suffocation	☐	FLD28 - Excavating/Trenching
Improper material handling	Back injury/crushing from load shifts	☐	FLD29 - Materials Handling
Physiochemical	Explosions/fires from oxidizing, flam./corr. material	☐	FLD30 - Hazardous Materials Use/Storage
Physiochemical	Fire and explosion	☐	FLD31 - Fire Prevention/Response Plan Required
Physiochemical	Fire	☒	FLD32 - Fire Extinguishers Required
Structural integrity	Overhead/electrocution/slips/trips/falls/fire	☐	FLD33 - Demolition
Electrical	Electrocution/shock/thermal burns	☐	FLD34 - Utilities
Electrical	Electrocution/shock/thermal burns	☐	FLD35 - Electrical Safety
Burns/fires	Heat stress/fires/burns	☐	FLD36 - Welding/Cutting/Burning
Impact/thermal	Thermal burns/high pressure impaction/heat stress	☐	FLD37 - High Pressure Washers
Impaction/electrical	Smashing body parts/pinching/cuts/electrocution	☐	FLD38 - Hand and Power Tools
Poor visibility	Slips/trips/falls	☐	FLD39 - Illumination
Fire/explosion	Burns/impaction	☐	FLD40 - Storage Tank Removal/Decommissioning
Communications	Disruption of communications	☒	FLD41 - Std. Hand/Emergency Signals
Energy/release	Unexpected release of energy	☐	FLD42 - Lockout/Tagout
Logging/ground clearing/grubbing activities	Operations associated with felling/moving of trees/brush/logs	☐	FLD47 - Clearing, Grubbing, and Logging Operations
Drilling hazards	Electrocution/overhead hazards/pinch points	☒	1.6 - Drilling Safety Guide

TASK-BY-TASK RISK ASSESSMENT-FORM 8

TASK DESCRIPTION

1) Geologic Groundwater Investigation/Sampling
2) Geologic Soil and Sediment Investigation/Sampling
3) Oversight
4) Well Installation

EQUIPMENT REQUIRED/USED
(Be specific, e.g., hand tools, heavy equipment, instruments, PPE)

Geoprobe, Drill, hand auger, TVA 1000, Water Quality instrument, sampling containers, Level D PPE

POTENTIAL HAZARDS/RISKS

Chemical

☒ Hazard Present Risk Level: ☐ H ☐ M ☒ L

What justifies risk level?

Past results indicated TCE and PCE results ranging from 1 to 10 ppb (water) and 5-250 ppm (soil).

Physical

☒ Hazard Present Risk Level: ☐ H ☒ M ☐ L

What justifies risk level?

The ground water and soil investigation tools/drill can cause a potential physical hazard if not used properly.
Working in proximity to traffic may potentially cause a physical hazard.

Biological

☒ Hazard Present Risk Level: ☐ H ☐ M ☒ L

What justifies risk level?

Work will be conducted outdoors, where animals or insects may be present.

RADIOLOGICAL

☐ Hazard Present Risk Level: ☐ H ☐ M ☐ L

What justifies risk level?

LEVELS OF PROTECTION/JUSTIFICATION

Level D

SAFETY PROCEDURES REQUIRED AND/OR FIELD OPS UTILIZED

WESTON FLD/ SOP on site at all times.

PERSONNEL PROTECTION PLAN-FORM 9

Engineering Controls
Describe Engineering Controls used as part of Personnel Protection Plan:

Task(s)

1	Installing restriction area near the drilling or geoprobing.
2	Installing restriction area near the drilling or geoprobing.
4	Installing restriction area near the drilling or geoprobing.

Administrative Controls
Describe Administrative Controls used as part of Personnel Protection Plan:

Task(s)

1	Limit time in the Exclusion Zone. Take proper breaks. Enforce proper PPE usage. Traffic safety signs, cones and reflective vests will be used when working in proximity to traffic.
2	Limit time in the Exclusion Zone. Take proper breaks. Enforce proper PPE usage. Traffic safety signs, cones and reflective vests will be used when working in proximity to traffic.
3	Limit time in the Exclusion Zone. Take proper breaks. Enforce proper PPE usage. Traffic safety signs, cones and reflective vests will be used when working in proximity to traffic.

Personal Protective Equipment
Action Levels for Changing Levels of Protection. Refer to HASP Form 13, Site Air Monitoring Program—Action Levels. Define Action Levels for up or down grade for each task:

Task(s)

1	Level D
2	Level D
3	Level D

DESCRIPTION OF LEVELS OF PROTECTION

Level D		Level D Modified
Task(s):		**Task(s):**
☒ Head	Hard Hat	☐ Head
☒ Eye and Face	Safety Glasses	☐ Eye and Face
☒ Hearing (Case by Case basis-SHSC)	Ear Plugs	☐ Hearing
☐ Arms and Legs Only		☐ Arms and Legs Only
☐ Appropriate Work Uniform		☐ Whole Body
☒ Hand - Gloves	Nitrile-Surgical	☐ Apron
☒ Foot	Safety Boots	☐ Hand - Gloves
☐ Fall Protection		☐ Gloves
☒ Waiters (Only during sediment sampling)	Hip length	☐ Gloves
☒ Other (Depending on work location-SHSC)	Reflective Vest	☐ Foot - Safety Boots
		☐ Over Boots

DESCRIPTION OF LEVELS OF PROTECTION-FORM 10

Level C	Level B
Task(s):	**Task(s):**
☐ Head	☐ Head
☐ Eye and Face	☐ Eye and Face
☐ Hearing	☐ Hearing
☐ Arms and Legs Only	☐ Arms and Legs Only
☐ Whole Body	☐ Whole Body
☐ Apron	☐ Apron
☐ Hand - Gloves	☐ Hand - Gloves
☐ Gloves	☐ Gloves
☐ Gloves	☐ Gloves
☐ Foot - Safety Boots	☐ Foot - Safety Boots
☐ Outer Boots	☐ Outer Boots
☐ Boots (Other) _____	☐ Boots (Other) _____
☐ Half Face	☐ SAR - Airline
☐ Cart./Canister	☐ SCBA
☐ Full Face	☐ Comb. Airline/SCBA
☐ Cart./Canister	☐ Cascade System
☐ PAPR	☐ Compressor
☐ Cart./Canister	☐ Fall Protection
☐ Type C	☐ Flotation
☐ Fall Protection	☐ Other
☐ Flotation	
☐ Other	

SITE OR PROJECT HAZARD MONITORING PROGRAM-FORM 11

Air Monitoring Instruments

Instrument Selection and Initial Check Record

Reporting Format: ☒ Field Notebook ☐ Field Data Sheets* ☐ Air Monitoring Log ☐ Trip Report ☐ Other

Instrument	Task No.(s)	Number Required	Number Received	Checked Upon Receipt	Comment	Initials
☐ CGI				☐		
☐ O_2				☐		
☐ CGI/O_2				☐		
☐ CGI/O_2/tox-PPM, H_2S,H_2S/CO				☐		
☐ RAD				☐		
☐ GM (Pancake)				☐		
☐ NaI (Micro R)				☐		
☐ ZnS (Alpha Scintillator)				☐		
☐ Other _____				☐		
☒ PID				☐		
☐ HNu 10.2				☐		
☐ HNu 11.7				☐		
☐ Photovac, TMA				☐		
☐ OVM				☐		
☐ Other _____				☐		
☒ FID				☐		
☐ Fox 128				☐		
☐ Heath, AID, Other				☐		
☐ RAM, Mini-RAM, Other _____				☐		
☐ Monitox				☐		
Specify: _____				☐		
☐ Personal Sampling				☐		
Specify: _____				☐		
☐ Bio-Aerosol Monitor				☐		
☐ Pump - MSA, Dräeger, Sensidyne				☐		
☐ Tubes/type: _____				☐		
☐ Tubes/type: _____				☐		
☒ Other: TVA 1000 (FID/PID)	1,2,3,4			☐		

SITE OR PROJECT HAZARD MONITORING PROGRAM-FORM 12

Air Monitoring Instruments Calibration Record

Instrument, Mfg., Model, Equip. ID No.	Date	Time	Calib. Material	Calib. Method Mfg.'s	Other	Initial Setting and Reading	Final Setting and Reading	Calibrator's Initials

SITE AIR MONITORING PROGRAM-FORM 13

Action Levels

These Action Levels, if not defined by regulation, are some percent (usually 50%) of the applicable PEL/TLV/REL. That number must also be adjusted to account for instrument response factors.

	Tasks	Action Level		Action
☐ **Explosive atmosphere**		Ambient Air Concentration	Confined Space Concentration	
		<10% LEL	0 to 1% LEL	Work may continue. Consider toxicity potential.
		10 to 25% LEL	1 to 10% LEL	Work may continue. Increase monitoring frequency.
		>25% LEL	>10% LEL	Work must stop. Ventilate area before returning.
☐ **Oxygen**		Ambient Air Concentration	Confined Space Concentration	
		<19.5% O_2	<19.5% O_2	Leave area. Re-enter only with self-contained breathing apparatus.
		19.5% to 25% O_2	19.5% to 23.5% O_2	Work may continue. Investigate changes from 21%.
		>25% O_2	>23.5% O_2	Work must stop. Ventilate area before returning.
☐ **Radiation**		< 3 times background		Continue work.
		3 times background to < 1 mR/hour		Radiation above background levels (normally 0.01-0.02 mR/hr) signifies possible radiation source(s) present. Continue investigation with caution. Perform thorough monitoring. Consult with a Health Physicist.
		> 1 mrem/hour		Potential radiation hazard. Evacuate site. Continue investigation only upon the advice of Health Physicist.
☒ **Organic gases and vapors**	1, 2, 3	Level D <5 ppm Level C 5-50 ppm SHSC will determine PPE upgrades and down grades		Continue work Work must stop. PPE upgrade upon the advice of SHSC.
☐ **Inorganic gases, vapors, and particulates**				

CONTINGENCIES-FORM 14

Emergency Contacts and Phone Numbers

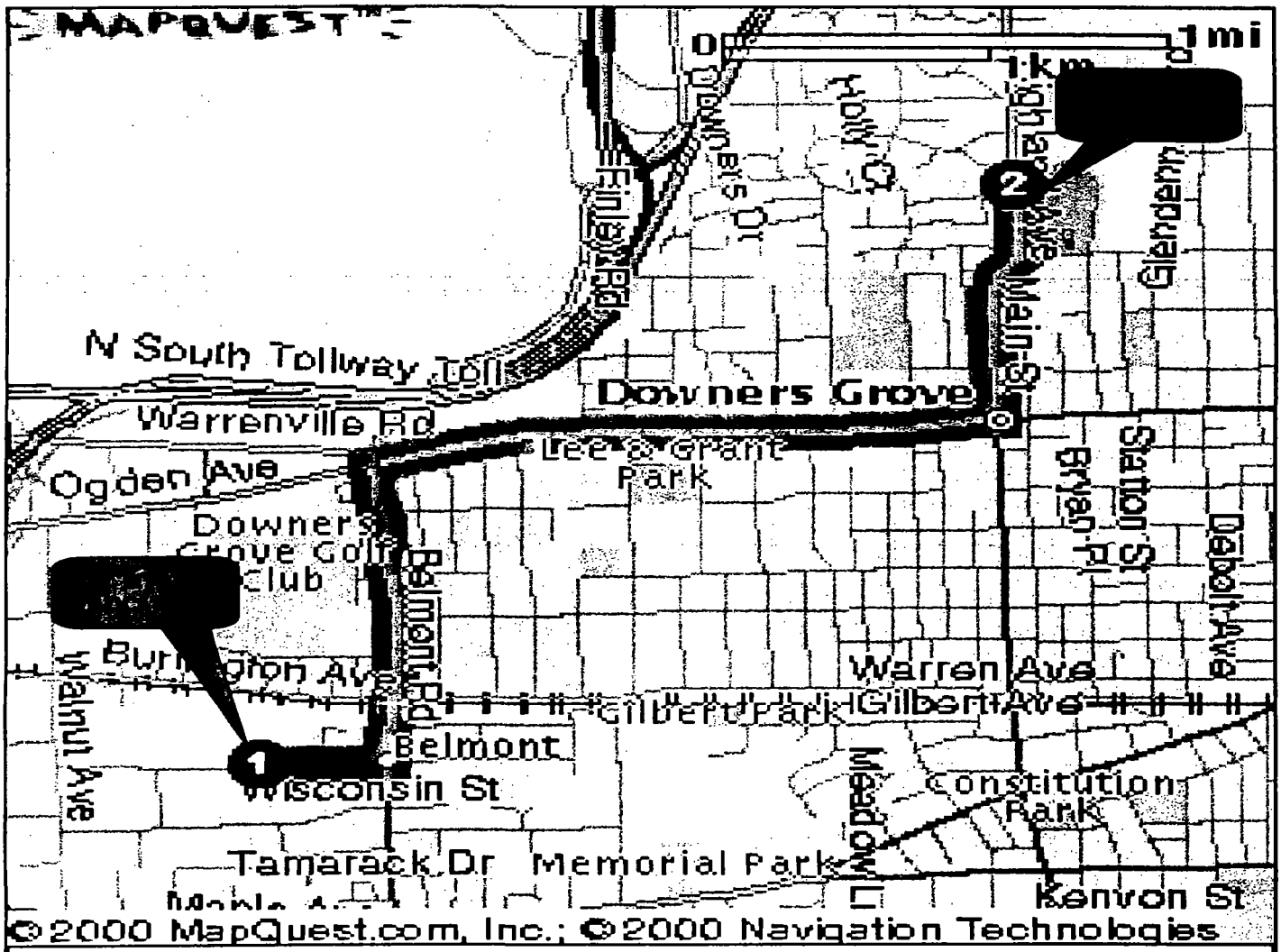
Agency	Contact	Phone Number
Local Medical Emergency Facility (LMF)	Advocate Good Samaritan Hospital	(630) 275-5900
WESTON Medical Emergency Contact	EMR - Dr. Elyane Theriault	1-800-229-3674
WESTON Health and Safety	Corporate Health and Safety Ron Bugg/ START H&S Manager	(610) 701-3000 (312) 424-3305
Fire Department	911	911
Police Department	911	911
On-Site Coordinator- SHSC	Ben Maradkel	312/ 424-3314
Client Site Contact	Steve Faryan	312/ 353-9351
Site Telephone	Ben Maradkel	(cell phone) (773) 294-0256
Nearest Telephone	Ben Maradkel	(cell phone) (773) 294-0256

Local Medical Emergency Facility(s)

Name of Hospital: Advocate Good Samaritan Hospital

Address: 3815 Highland Avenue Downers Grove, IL	**Phone No** 630.275.5900

Type of Service: ☐ Physical trauma only ☐ Chemical exposure only ☒ Physical trauma and chemical exposure ☒ Available 24 hours	**Route to Hospital (written detail):** **Left on Belmont. Right on Ogden. Left on Main (Main Street becomes Highland Ave.) See next page for map.**	**Travel time from site:** 8 min. **Distance to hospital:** 3.4



WESTON MANAGERS DESIGNERS/CONSULTANTS

Roy F. Weston, Inc.
Region 5 – Superfund Technical Assessment and Response Team
3 First National Plaza, Suite 1990, Chicago IL 60602

Title: Hospital Map	Figure: 1
Site: Downers Grove Site	Scale: NOT TO SCALE
City: Downers Grove / State: Illinois	Date: 1/15/01

Welcome, Guest User

Create My Locations - Sign In

Yahoo! Maps - Driving Directions

Starting from: 2500 Curtiss, Downers Grove, IL 60515-4058

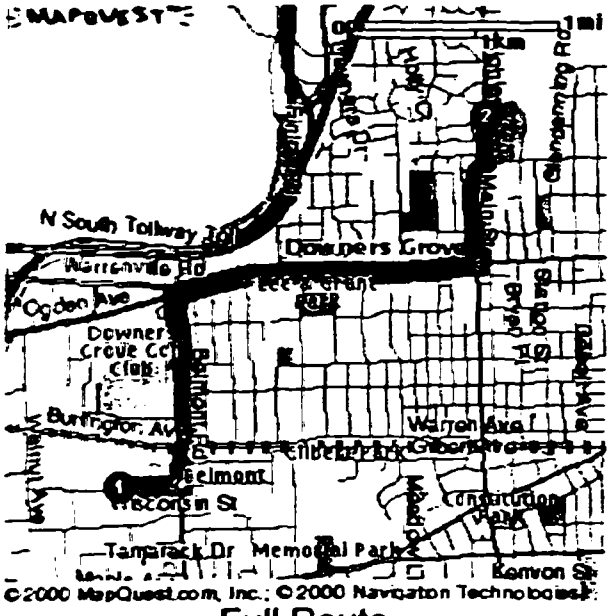
Arriving at: 3815 Highland, Downers Grove, IL 60515-1500

Distance: 3.4 miles **Approximate Travel Time:** 8 mins

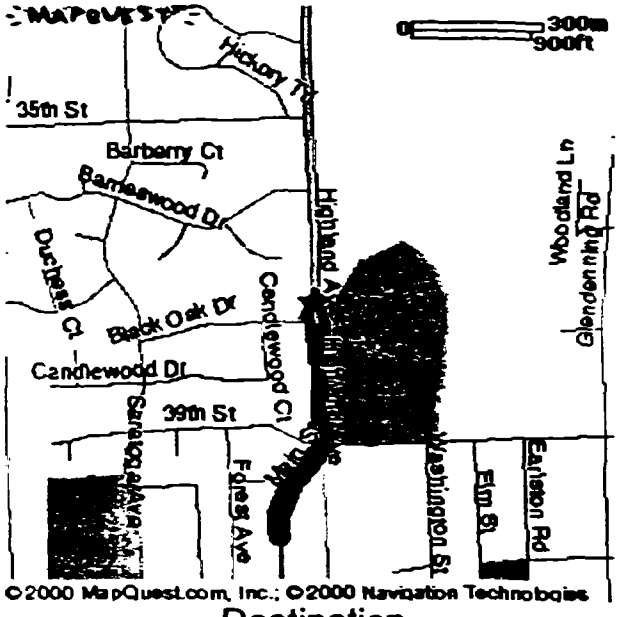
Email Directions

Get Reverse Directions

Text Only Driving Directions



Full Route



Destination

Directions	Miles
1. Start out going East on **CURTISS ST** towards **CHASE AVE** by turning left.	0.3
2. Turn LEFT onto **BELMONT RD**.	1.0
3. Turn RIGHT onto **OGDEN AVE/US-34**.	1.4
4. Turn LEFT onto **MAIN ST**.	0.5
5. **MAIN ST** becomes **HIGHLAND AVE**.	0.2

When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.

CONTINGENCIES-FORM 16

Response Plans

Medical - General	First Aid Kit: YES	Type A	Location Vehicle	Special First-Aid Procedures: Cyanides on-site ☐ Yes ☒ No If yes, contact LMF. Do they have antidote kit? ☐ Yes ☒ No
Provide first aid, if trained; assess and determine need for further medical assistance. Transport or arrange for transport after appropriate decontamination.	Eyewash required ☒ Yes ☐ No	Type Eye wash solution bottle	Location Vehicle	**HF** on-site ☐ Yes ☒ No If yes, need neutralizing ointment for first-aid kit. Contact LMF.
	Shower required ☐ Yes ☒ No	Type	Location	

Plan for Response to Spill/Release		**Plan for Response to Fire/Explosion**		**Fire Extinguishers YES**
In the event of a spill or release, ensure safety, assess situation, and perform containment and control measures, as appropriate.	a. Cleanup per MSDSs if small; or sound alarm, call for assistance, notify Emergency Coordinator b. Evacuate to pre-determined safe place c. Account for personnel d. Determine if team can respond safely e. Mobilize per Site Spill Response Plan	In the event of a fire or explosion, ensure personal safety, assess situation, and perform containment and control measures, as appropriate:	a. Sound alarm and call for assistance, notify Emergency Coordinator b. Evacuate to predetermined safe place c. Account for personnel d. Use fire extinguisher only if safe and trained in its use e. Stand by to inform emergency responders of materials and conditions	Type/Location ABC/near work area ___/___ ___/___ ___/___ ___/___ ___/___ ___/___

Description of Spill Response Gear	Location	Description (Other Fire Response Equipment)	Location
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Plan to Respond to Security Problems

DECONTAMINATION PLAN-FORM 17

Personnel Decontamination

Consistent with the levels of protection required, step-by-step procedures for personnel decontamination for each level of protection are attached.

Levels of Protection Required for Decontamination Personnel

The levels of protection required for personnel assisting with decontamination will be:

☐ Level B ☐ Level C ☒ Level D

Modifications include:

Disposition of Decontamination Wastes

Provide a description of waste disposition, including identification of storage area, hauler, and final disposal site, if applicable:

If contamination is not detected, the material will be considered non-hazards and discarded as such. If the material is determined to be hazards waste the material will be labeled as such & left on site W/ OSC approval.

Equipment Decontamination

A procedure for decontamination steps required for non-sampling equipment and heavy machinery follows:

All non-disposable drilling (e.g. rods) equipment that comes into contact with site soils, sediments, and surface water will either be steam cleaned or gross decontaminated with distilled-water and brush, washed with Alconox solution and rinsed with distilled water.

Sampling Equipment Decontamination

Sampling equipment will be decontaminated in accordance with the following procedure:

All non-disposable sampling equipment that comes into contact with site soils, sediments, and surface water will either be steam cleaned or gross decontaminated with distilled-water and brush, washed with Alconox solution and rinsed with distilled water.

LEVEL D/MODIFIED LEVEL D DECONTAMINATION PLAN-FORM 18

Check indicated functions or add steps, as necessary:

Function	Description of Process, Solution, and Container
☐ Segregated equipment drop	
☐ Boot cover and glove wash	
☐ Boot cover and glove rinse	
☒ Hip Waiters	Used during sediment sampling. Remove, decon and air dry.
☒ Boot cover removal	Remove and dispose in designated bag.
☒ Outer glove removal	Remove and dispose in designated bag.
HOTLINE	
☐ Suit/safety boot wash	
☐ Suit/boot/glove rinse	
☐ Safety boot removal	
☐ Suit removal	
☐ Inner glove wash	
☐ Inner glove rinse	
☐ Inner glove removal	
☐ Inner clothing removal	
CONTAMINATION REDUCTION ZONE (CRZ)/SAFE ZONE BOUNDARY	
☐ Field wash	
☐ Redress	

Disposal Plan, End of Day:

All used disposable PPE and disposal site material (boots, gloves, paper towels etc..) will be properly contained, drummed, and left on site to be disposed of at the discretion of the U.S. EPA OSC. At the end of investigation at each facility, the drums containing IDW will be transferred in a central location for disposal at the end of project.

Disposal Plan, End of Week:

All used disposable PPE and disposal site material (boots, gloves, paper towels etc..) will be properly contained, drummed, and left on site to be disposed of at the discretion of the U.S. EPA OSC. At the end of investigation at each facility, the drums containing IDW will be transferred in a central location for disposal at the end of project.

Disposal Plan, End of Project:

All used disposable PPE and disposal site material (boots, gloves, paper towels etc..) will be properly contained, drummed, and left on site to be disposed of at the discretion of the U.S. EPA OSC. At the end of investigation at each facility, the drums containing IDW will be transferred in a central location for disposal at the end of project.

SITE PERSONNEL AND CERTIFICATION STATUS FORM 21	
WESTON	
Name: Ben Maradkel **Title: Site Lead/ SHSC** **Task(s): Oversight, Documentation, Sampling, Air Monitoring** **Certification Level or Description:** ☒ Medical Current ☒ Training Current ☒ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name: Om Patel** **Title: Project Manager** **Task(s): Oversight** **Certification Level or Description:** ☒ Medical Current ☒ Training Current ☒ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: Kurt Fischer **Title: Geologist** **Task(s): Oversight** **Certification Level or Description:** ☒ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)

TRAINING CURRENT - Training: All personnel, including visitors, entering the exclusion or contamination reduction zones must have certifications of completion of training in accordance with OSHA 29 CFR 1910, 29 CFR 1926, or 29 CFR 1910.120.

FIT TEST CURRENT - Respirator Fit Testing: All persons, including visitors, entering any area requiring the use or potential use of any negative pressure respirator must have had, as a minimum, a qualitative fit test, administered in accordance with OSHA 29 CFR 1910.134 or ANSI, within the last 12 months. If site conditions require the use of a full-face, negative-pressure, air-purifying respirator for protection from asbestos or lead, employees must have had a qualitative fit test, administered according to OSHA 29 CFR 1910.1001 or 1025/1926, within the last 6 months.

MEDICAL CURRENT - Medical Monitoring Requirements: All personnel, including visitors, entering the exclusion or contamination reduction zones must be certified as medically fit to work and to wear a respirator, if appropriate, in accordance with 29 CFR 1910, 29 CFR 1926/1910, or 29 CFR 1910.120.

The Site Health and Safety Coordinator is responsible for verifying all certifications and fit tests.

SITE PERSONNEL AND CERTIFICATION STATUS-FORM 22

Subcontractor's Health and Safety Program Evaluation

Name of Subcontractor:
Address:

Activities To Be Conducted by Subcontractor:

Evaluation Criteria

Medical program meets OSHA/WESTON criteria	Personal protective equipment available	On-site monitoring equipment available, calibrated, and operated properly
☒ Acceptable ☐ Unacceptable Comments:	☒ Acceptable ☐ Unacceptable Comments:	☒ Acceptable ☐ Unacceptable Comments:
Safe working procedures clearly specified	**Training meets OSHA/WESTON criteria**	**Emergency procedures**
☒ Acceptable ☐ Unacceptable Comments:	☒ Acceptable ☐ Unacceptable Comments:	☒ Acceptable ☐ Unacceptable Comments:
Decontamination procedures	**General health and safety program evaluation**	**Additional comments:**
☒ Acceptable ☐ Unacceptable Comments:	☒ Acceptable ☐ Unacceptable Comments:	☒ Subcontractor has agreed to and will conform with the WESTON HASP for this project. ☐ Subcontractor will work under his own HASP, which has been accepted by project PM.

Evaluation Conducted by: **Date:**

Subcontractor

Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)

HEALTH AND SAFETY PLAN APPROVAL SIGNATURE FORM

Site Name: Downers Grove Site	WO#: 12634-001-001-0195-00
Address: Downers Grove Industrial Park Downers Grove, IL	

I understand, agree to, and will conform with the information set forth in this Health and Safety Plan (and attachments) and discussed in the personnel health and safety briefing(s).

Name	Signature	Date

TRAINING AND BRIEFING TOPICS-FORM 24

The following items will be covered at the site-specific training meeting, daily or periodically.

☐ Site characterization and analysis, Sec. 3.0, 29 CFR 1910.120 I	☐ Level A
☒ Physical hazards, HASP Form 07	☐ Level B
☒ Chemical hazards, HASP Form 04	☐ Level C
☐ Animal bites, stings, and poisonous plants	☒ Level D
☐ Etiologic (infectious) agents	☒ Monitoring, 29 CFR 1910.120 (h)
☒ Site control, 29 CFR 1910.120 d	☒ Decontamination, 29 CFR 1910.120 (k)
☐ Engineering controls and work practices, 29 CFR 1910.120 (g)	☐ Emergency response, 29 CFR 1910.120 (l)
☒ Heavy machinery	☒ Elements of an emergency response, 29 CFR 1910.120 (l)
☐ Forklift	☐ Procedures for handling site emergency incidents, 29 CFR 1910.120 (l)
☐ Backhoe	☐ Off-site emergency response, 29 CFR 1910.120 (l)
☒ Equipment	☐ Handling drums and containers, 29 CFR 1910.120 (j)
☐ Tools	☐ Opening drums and containers
☐ Ladder, 29 CFR 1910.27 (d)/29 CFR 1926	☐ Electrical material handling equipment
☐ Overhead and underground utilities	☐ Radioactive waste
☐ Scaffolds	☐ Shock-sensitive waste
☐ Structural integrity	☐ Laboratory waste packs
☐ Unguarded openings - wall, floor, ceilings	☐ Sampling drums and containers
☐ Pressurized air cylinders	☐ Shipping and transport, 49 CFR 172.101, IATA
☒ Personal protective equipment, 29 CFR 1910.120 (g); 29 CFR 1910.134	☐ Tank and vault procedures
☐ Respiratory protection, 29 CFR 1910.120 (g); ANSI Z88.2	☐ Illumination, 29 CFR 1910.120 (m)
☐	☐ Sanitation, 29 CFR 1910.120 (n)
☐	☐
☐	☐
☐	☐

HEALTH AND SAFETY EVALUATION- 1 CHEMICAL HAZARDS-FORM 25

Hazardous Substance/Tasks	Physical Properties	Normal Physical State	State At Site/Proj. Temp.	Characteristics	Exposure Limits	Route(s) of Exposure/ Symptoms	Monitoring Instruments/ Ionization Potential + % Response
	☐ Explosive ☐ Flammable ☐ Corrosive ☐ Reactive ☐ Water Reactive ☐ Oxidizer	☐ Solid ☐ Liquid ☐ Gas	☐ Solid ☐ Liquid ☐ Gas	pH: FP: LEL: UEL: Auto. Ig.: BP:	☐ CA ____ ☐ PEL ____ ☐ TLV ____ ☐ IDLH ____ ☐ Only toxicological data available ☐ Other:	☐ Inhalation ☐ Ingestion ☐ Skin Absorption ☐ Contact ☐ Direct Penetration ☐ Other: _____	☐ HNu ☐ 11.7 eV ☐ 10.2 eV ☐ OVM ☐ 10.0/10.6 eV ☐ 11.8 eV ☐ CGI ☐ OVA ☐ _____
CAS No:	☐ Radioactive ☐ Other	Incompatible With:		MP: Sp. Gr.: Vap. D.: Vap. P.: H_2O Sol.: Other:			
Synonyms:						Symptoms:	IP: % Response:

SITE-SPECIFIC HAZARD COMMUNICATION PROGRAM-FORM 28

Location-Specific Hazard Communication Program/Checklist

To ensure an understanding of and compliance with the Hazard Communication Standard, WESTON will use this checklist/document (or similar document) in conjunction with the WESTON Written Hazard Communication Program as a means of meeting site- or location-specific requirements.

While responsibility for activities within this document reference the WESTON Safety Officer (SO), it is the responsibility of all personnel to effect compliance. Responsibilities under various conditions can be found within the WESTON Written Hazard Communication Program.

To ensure that information about the dangers of all hazardous chemicals used by WESTON are known by all affected employees, the following Hazard Communication Program has been established. All affected personnel will participate in the Hazard Communication Program. This written program, as well as WESTON's Corporate Hazard Communication Program, will be available for review by any employee, employee representative, representative of OSHA, NIOSH, or any affected employer/employee on a multi-employer site.

☒ Site or other location name/address: 70 West Madison Chicago, IL Suite 1900 (WESTON office)

☒ Site/Project/Location Manager: Downers Grove Site/ OM Patel, Project Manager

☒ Site/Location Safety Officer: Downers Grove Site/ Ben Maradkel

☒ List of chemicals compiled, format: ☒ HASP ☐ Other: TCE, PCE

☒ Location of MSDS files: HASP (on site)

☒ Training conducted by: Name: _____ Date: _____

☒ Indicate format of training documentation: ☐ Field Log: ☒ Other: Certificates at office

☒ Client briefing conducted regarding hazard communication: PM

☒ If multi-employer site (client, subcontractor, agency, etc.), indicate name of affected companies:

TBD

☒ Other employer(s) notified of chemicals, labeling, and MSDS information: TBD

☒ Has WESTON been notified of other employer's or client's hazard communication program(s), as necessary? ☐ Yes ☒ No

List of Hazardous Chemicals

A list of known hazardous chemicals used by WESTON personnel must be prepared and attached to this document or placed in a centrally identified location with the MSDSs. Further information on each chemical may be obtained by reviewing the appropriate MSDS. The list will be arranged to enable cross-reference with the MSDS file and the label on the container. The SO or Location Manager is responsible for ensuring the chemical listing remains up-to-date.

Container Labeling

The WESTON SO will verify that all containers received from the chemical manufacturer, importer, or distributor for use on-site are clearly labeled.

The SO is responsible for ensuring that labels are placed where required and for comparing MSDSs and other information with label information to ensure correctness.

Material Safety Data Sheets (MSDSs) *FORM 28*

The SO is responsible for establishing and monitoring WESTON's MSDS program for the location. The SO will ensure that procedures are developed to obtain the necessary MSDSs and will review incoming MSDSs for new or significant health and safety information. He/she will see that any new information is passed on to the affected employees. If an MSDS is not received at the time of initial shipment, the SO will call the manufacturer and have an MSDS delivered for that product in accordance with the requirements of WESTON's Written Hazard Communication Program.

A log for, and copies of, MSDSs for all hazardous chemicals in use will be kept in the MSDS folder at a location known to all site workers. MSDSs will be readily available to all employees during each work shift. If an MSDS is not available, immediately contact the WESTON SO or the designated alternate. When a revised MSDS is received, the SO will immediately replace the old MSDS.

Employee Training and Information

The SO is responsible for the WESTON site-specific personnel training program. The SO will ensure that all program elements specified below are supplied to all affected employees.

At the time of initial assignment for employees to the work site, or whenever a new hazard is introduced into the work area, employees will attend a health and safety meeting or briefing that includes the information indicated below.

- Hazardous chemicals present at the work site.
- Physical and health risks of the hazardous chemicals.
- The signs and symptoms of overexposure.
- Procedures to follow if employees are overexposed to hazardous chemicals.
- Location of the MSDS file and Written Hazard Communication Program.
- How to determine the presence or release of hazardous chemicals in the employee's work area.
- How to read labels and review MSDSs to obtain hazard information.
- Steps WESTON has taken to reduce or prevent exposure to hazardous chemicals.
- How to reduce or prevent exposure to hazardous chemicals through the use of controls procedures, work practices, and personal protective equipment.
- Hazardous, nonroutine tasks to be performed (if any).
- Chemicals within unlabeled piping (if any).

Hazardous Nonroutine Tasks

When employees are required to perform hazardous nonroutine tasks, the affected employee(s) will be given information by the SO about the hazardous chemicals he or she may use during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use, and steps WESTON is using to reduce the hazards. These steps include, but are not limited to, ventilation, respirators, presence of another employee, and emergency procedures.

Chemicals in Unlabeled Pipes

Work activities may be performed by employees in areas where chemicals are transferred through unlabeled pipes. Prior to starting work in these areas, the employee will contact the SO, at which time information as to the chemical(s) in the pipes, potential hazards of the chemicals or the process involved, and the safety precautions that should be taken will be determined and presented.

Multi-Employer Work Sites

It is the responsibility of the SO to provide other employers with information about hazardous chemicals imported by WESTON to which their employees may be exposed, along with suggested safety precautions. It is also the responsibility of the SO and the Site Manager to obtain information about hazardous chemicals used by other employers to which WESTON

employees may be exposed. WESTON's chemical listing will be made available to other employers, as requested. MSDSs will be available for viewing, as necessary. The location, format, and/or procedures for accessing MSDS information must be relayed to affected employees.

SITE AIR MONITORING PROGRAM-FORM 29

Field Data Sheets

Location:

% LEL	% O_2	PID (units)	FID (units)	Aerosol Monitor (mg/m^3)	GM: Shield Probe/ Thin Window		NaI (uR/hr)	ZnS (cpm)
					mR/hr	cpm		

Monitox (ppm)				Detector Tube(s)				

Sound Levels (dBA)		Illumination	pH	Other	Other	Other	Other	Other

Location:

% LEL	% O_2	PID (units)	FID (units)	Aerosol Monitor (mg/m^3)	GM: Shield Probe/ Thin Window		NaI (uR/hr)	ZnS (cpm)
					mR/hr	cpm		

Monitox (ppm)				Detector Tube(s)				

Sound Levels (dBA)		Illumination	pH	Other	Other	Other	Other	Other

NIOSH Pocket Guide to Chemical Hazards

Trichloroethylene	CAS 79-01-6
$ClCH=CCl_2$	RTECS KX4550000
Synonyms & Trade Names Ethylene trichloride, TCE, Trichloroethene, Trilene	**DOT ID & Guide** 1710 160

Exposure Limits	NIOSH REL: Ca See Appendix A See Appendix C
	OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)

IDLH Ca [1000 ppm] See: 79016	**Conversion** 1 ppm = 5.37 mg/m^3

Physical Description
Colorless liquid (unless dyed blue) with a chloroform-like odor.

MW: 131.4	BP: 189°F	FRZ: -99°F	Sol(77°F): 0.1%
VP: 58 mmHg	IP: 9.45 eV		Sp.Gr: 1.46
Fl.P: ?	UEL(77°F): 10.5%	LEL(77°F): 8%	

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities
Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)

Measurement Methods
NIOSH 1022, 3800; OSHA 1001
See: NMAM or OSHA Methods

Personal Protection & Sanitation
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system

NIOSH Pocket Guide to Chemical Hazards

Tetrachloroethylene	CAS 127-18-4
$Cl_2C=CCl_2$	RTECS KX3850000
Synonyms & Trade Names Perchlorethylene, Perchloroethylene, Perk, Tetrachlorethylene	**DOT ID & Guide** 1897 160

Exposure Limits	NIOSH REL: Ca Minimize workplace exposure concentrations. See Appendix A
	OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 3-hours)

IDLH Ca [150 ppm] See: 127184	**Conversion** 1 ppm = 6.78 mg/m^3

Physical Description
Colorless liquid with a mild, chloroform-like odor.

MW: 165.8	BP: 250°F	FRZ: -2°F	Sol: 0.02%
VP: 14 mmHg	IP: 9.32 eV		Sp.Gr: 1.62
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene.

Incompatibilities & Reactivities
Strong oxidizers; chemically-active metals such as lithium, beryllium & barium; caustic soda; sodium hydroxide; potash

Measurement Methods
NIOSH 1003; OSHA 1001
See: NMAM or OSHA Methods

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: No recommendation Provide: Eyewash, Quick drench	**First Aid** (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, liver, kidneys, central nervous system

REVISED

EM SCIENCE

111 Woodcrest Road, P.O. Box 5018, Cherry Hill, N.J. 08034-0396, Phone (609) 354-9200

MATERIAL SAFETY DATA SHEET

Essentially Similar to U.S. Department of Labor Form OSHA-20

SECTION 1 NAME & PRODUCT

Chemical Name: Methanol

Catalog Number: MX0475, MX0483, MX0485, MX0487, MX0488, MX0489, MX0490

Trade Name & Synonyms: Methyl Alcohol, Wood Alcohol

Chemical Family: Alcohols

Formula: CH_3OH

CA #67-56-1

Formula Weight: 32.04

SECTION 2 PHYSICAL DATA

Boiling Point, 760 mm Hg (°C)	64.5°C	Specific Gravity (H_2O = 1)	0.79
Melting Point (°C)	-144°F	Solubility in H_2O, % by wt. at 20°C	Soluble
Vapor Pressure at 20°C	96 mm Hg	Appearance and Odor	colorless liquid
Vapor Density (air = 1)	1.1	slight alcoholic odor	
Percent Volatiles by Volume	100	Evaporation Rate (Butyl Acetate = 1)	5.91

SECTION 3 FIRE AND EXPLOSION HAZARD DATA

Flash Point (test method) 52°F (tcc)	Flammable Limits	Lel	6.7%	Uel	35%

Extinguishing Media CO_2, dry chemical, foam. Water spray to cool fire-exposed containers. Water spray to disperse vapors.

Special Hazards and Procedures: Wear self-contained breathing apparatus

Unusual Fire and Explosion Hazards: Addition of water to burning fuel may reduce intensity of flame

SECTION 4 REACTIVITY DATA

Stable	X	Conditions to Avoid
Unstable		heat, sparks, open flame

Materials to Avoid: Oxidizers

Hazardous Decomposition Products: CO_x

SECTION 5 SPILL OR LEAK PROCEDURES AND DISPOSAL

Steps to be Taken in Case Material is Released or Spilled: Evacuate non-essential personnel. Absorb with sand.

Waste Disposal Method: To be performed in compliance with all current local, state and federal regulations

AX1699M, MX0475, MX0483, MX048 5, MX0487, MX0488, MX0489, MX0490

SECTION 6 HEALTH HAZARD DATA

Threshold Limit Value

OSHA std-air: TWA 200 ppm TXDS: orl -hmn LDLo: 340 mg/kg

Effects of Overexposure

Highly toxic by fumes and contact; ingest. ion may be fatal and daily contact will have cumulative effect. May cause inebriation, nausea, vomiting; central nervous system damage; blindness; defatting, drying an. d cracking of the skin.

First Aid Procedures

Skin: wash with soap/water; get medical assistance for skin irritat ion
Eyes: fluch with water 15 minutes; get medical assistance
Inhalation: remove to fresh air; get medical assistance
Ingestion: induce vomiting if conscious; get medical assistance

SECTION 7 SPECIAL PROTECTION INFORMATION

Ventilation, Respiratory Protection, Protective Clothing, Eye Protection

Provide adequate general mechanical and local exhaust ventilation
Protect eyes and skin with safety goggles and gloves
Wear air-supplied mask; face shield may be necessary
Do not breathe vapor
Do not get in eyes or on clothing

SECTION 8 SPECIAL HANDLING AND STORING PRECAUTIONS

Keep container tightly closed
No smoking or flares
Store in a well-ventilated area, away from sources of ignition
Avoid prolonged or repeated contact with skin
If ingested, can cause blindness; cannot be made non-poisonous

SECTION 9 HAZARDOUS INGREDIENTS

(refer to section 3 through 8)

SECTION 10 OTHER INFORMATION

NFPA 704: 1 Health 3 Flammability 0 Reactivity

EMERGENCY PHONE NUMBER (609) 423-6300

AUTHORIZED SIGNATURE [signature]

DATE ISSUED 10/83

DATE REVISED 5/85

EM00147A

MATERIAL SAFETY DATA SHEET

LIQUID CARBONIC
SPECIALTY GAS CORPORATION
135 SOUTH LA SALLE STREET • CHICAGO ILLINOIS 60603 4282
PHONE (312) 855-2500

Isobutylene

Revision Feb. 1987

24 Hour Emergency Phone Numbers: (504)673-8831; CHEMTREC (800)424-9300

SECTION I--PRODUCT IDENTIFICATION

CHEMICAL NAME: Isobutylene
COMMON NAME AND SYNONYMS: Isobutene, 2-Methylpropene
CHEMICAL FAMILY: Aliphatic Hydrocarbons FORMULA: $(CH_3)_2CH$

SECTION II--HAZARDOUS INGREDIENTS

MATERIAL	VOLUME %	CAS NO.	1985-6 ACGIH TLV UNITS
Isobutylene	99.5	115-11-7	TWA 1,000 ppm STEL 1,250 ppm **for LPG (Liquified Petroleum Gas)**

SECTION III--PHYSICAL DATA

BOILING POINT (°F.)	19.6	SPECIFIC GRAVITY (H_2O=1)	0.594 @ 20°C
VAPOR PRESSURE (mmHg.)	24.3 psig @ 70°F	% VOLATILE BY VOLUME	100
VAPOR DENSITY (AIR=1)	2.011	EVAPORATION RATE (BUTYL ACETATE=1)	Rapid
SOLUBILITY IN WATER	Insoluble		
APPEARANCE AND ODOR	A colorless flammable gas with an unpleasant odor similar to coal gas.		

SECTION IV--FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED) -105°F(C.C.) FLAMMABLE LIMITS LEL 1.8 UEL 8.8
EXTINGUISHING MEDIA: Carbon Dioxide, dry chemical, halon and water.
SPECIAL FIRE FIGHTING PROCEDURES: Stop flow of gas if possible. Use water spray to cool fire exposed containers. If feasible, allow fire to burn itself out to avoid accumulation of an unburned flammable mixture.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep personnel away from fire scene since containers can rupture violently when exposed to fire. Fire fighters should use self-contained breathing apparatus and protective clothing. Unless gas supply is shut-off, it can reignite or explode. Vapor can flow to distant ignition source than flash back.

SECTION V--HEALTH HAZARD DATA

Route(s) of Entry: Inhalation? Yes Skin? Yes Ingestion? No
Carcinogenicity: NTP? No IARC Monographs? No OSHA? No
EFFECTS OF OVEREXPOSURE: Isobutylene is defined as a simple asphyxiant by displacing air. Can cause dizziness, drowsiness, and eventual unconsciousness. Liquid contact with eyes or skin may cause tissue freezing or frostbite.
EMERGENCY AND FIRST AID PROCEDURES: If inhaled: Remove to fresh air. Obtain prompt medical assistance. Unconscious persons should be given artificial resuscitation and supplemental oxygen. Keep warm and at rest.
Eye or skin contact: Promptly flush affected areas with copious quantities of tepid water (105-115°F). Remove contaminated clothing. A physician should see the patient promptly, if cryogenic burn has resulted in blistering of the dermal surface or deep tissue freezing.

SECTION VI--REACTIVITY DATA

STABILITY: UNSTABLE ( ) STABLE (X)

CONDITIONS TO AVOID: Heat, flame, direct sunlight and ignition sources.

INCOMPATABILITY (MATERIALS TO AVOID): Oxygen and strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: CO_2 and water vapor. Can produce carbon monoxide when oxidized with deficiency of oxygen.
HAZARDOUS POLYMERIZATION: MAY OCCUR ( ) WON'T OCCUR (X)

CONDITIONS TO AVOID: N/A

SECTION VII--SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Evacuate all personnel from affected area. Stop leaks if possible. Emergency personnel should use self-contained breathing apparatus and should have protective clothing. Eliminate sources of ignition. Supply maximum ventilation with explosion-proof equipment.

WASTE DISPOSAL METHOD: Relocate leaking containers in a remote downwind area out doors, and allow to vent to atmosphere. Incinerate gas by controlled burning in flare if possible. Follow Federal, State and Local regulations.

SECTION VIII--SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use self-contained breathing apparatus when necessary.

VENTILATION: LOCAL EXHAUST (X) Provide adequate ventilation in sumps, MECHANICAL (GENERAL) (X) confined areas and to meet TWA standards.

PROTECTIVE GLOVES: Rubber or plastic EYE PROTECTION: Safety goggles, safety glasses or face shield.
OTHER PROTECTIVE EQUIPMENT: Safety shoes, eyewash, safety shower and protective clothing if liquid contact potential exists.

SECTION IX--SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Protect cylinders against physical damage. Store in cool, dry, well-ventilated area, away from sources of heat and ignition. Keep away from oxidizers such as oxygen, chlorine and fluorine. Electrical equipment should be explosion-proof. Piping connections and containers should be grounded. Use check valve or trap in discharge line to prevent hazardous back flow. Post "No Smoking" or "Open Flame" signs in storage and use areas. Cylinder temperature should be kept under 130°F.
OTHER PRECAUTIONS: Use only DOT or ASME coded containers. Electrically ground all lines and equipment. Cylinders must not be recharged except by or with consent of Liquid Carbonic. For more information, refer to CGA Bulletin SB-2 "Oxygen Deficient Atmospheres" and CGA Pamphlet P-1 "Safe Handling of Compressed Gases in containers.

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

TRICHLOROETHYLENE

MSDS Number: T4940 — *Effective Date: 09/14/00*

1. Product Identification

Synonyms: Trichloroethene; TCE; acetylene trichloride; Ethinyl trichloride
CAS No.: 79-01-6
Molecular Weight: 131.39
Chemical Formula: C2HCl3
Product Codes:
J.T. Baker: 5376, 9454, 9458, 9464, 9473, 9474
Mallinckrodt: 8598, 8600, 8633

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Trichloroethylene	79-01-6	100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing)
Flammability Rating: 1 - Slight

Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:
Vapors can irritate the respiratory tract. Causes depression of the central nervous system with symptoms of visual disturbances and mental confusion, incoordination, headache, nausea, euphoria, and dizziness. Inhalation of high concentrations could cause unconsciousness, heart effects, liver effects, kidney effects, and death.

Ingestion:
Cases irritation to gastrointestinal tract. May also cause effects similar to inhalation. May cause coughing, abdominal pain, diarrhea, dizziness, pulmonary edema, unconsciousness. Kidney failure can result in severe cases. Estimated fatal dose is 3-5 ml/kg.

Skin Contact:
Cause irritation, redness and pain. Can cause blistering. Continued skin contact has a defatting action and can produce rough, dry, red skin resulting in secondary infection.

Eye Contact:
Vapors may cause severe irritation with redness and pain. Splashes may cause eye damage.

Chronic Exposure:
Chronic exposures may cause liver, kidney, central nervous system, and peripheral nervous system effects. Workers chronically exposed may exhibit central nervous system depression, intolerance to alcohol, and increased cardiac output. This material is linked to mutagenic effects in humans. This material is also a suspect carcinogen.

Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders, cardiovascular disorders, impaired liver or kidney or respiratory function, or central or peripheral nervous system disorders may be more susceptible to the effects of the substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician.

Skin Contact:
Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:
Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

5. Fire Fighting Measures

Fire:
Autoignition temperature: 420C (788F)
Flammable limits in air % by volume:
lel: 8; uel: 12.5
Explosion:
A strong ignition source, e. g., a welding torch, can produce ignition. Sealed containers may rupture when heated.
Fire Extinguishing Media:
Use water spray to keep fire exposed containers cool. If substance does ignite, use CO2, dry chemical or foam.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Combustion by-products include phosgene and hydrogen chloride gases. Structural firefighters' clothing provides only limited protection to the combustion products of this material.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Trichloroethylene:
-OSHA Permissible Exposure Limit (PEL):
100 ppm (TWA), 200 ppm (Ceiling),
300 ppm/5min/2hr (Max)

-ACGIH Threshold Limit Value (TLV):
50 ppm (TWA) 100 ppm (STEL);

listed as A5, not suspected as a human carcinogen.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). This substance has poor warning properties. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene is a recommended material for personal protective equipment.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:

Clear, colorless liquid.

Odor:

Chloroform-like odor.

Solubility:

Practically insoluble in water. Readily miscible in organic solvents.

Specific Gravity:

1.47 @ 20C/4C

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

87C (189F)

Melting Point:

-73C (-99F)

Vapor Density (Air=1):

4.5

Vapor Pressure (mm Hg):

57.8 @ 20C (68F)

Evaporation Rate (BuAc=1):

No information found.

---

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Will slowly decompose to hydrochloric acid when exposed to light and moisture.

Hazardous Decomposition Products:

May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong caustics and alkalis, strong oxidizers, chemically active metals, such as barium, lithium, sodium, magnesium, titanium and beryllium, liquid oxygen.

Conditions to Avoid:

Heat, flame, ignition sources, light, moisture, incompatibles

---

11. Toxicological Information

Toxicological Data:

Trichloroethylene: Oral rat LD50: 5650 mg/kg; investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:

This material has been linked to mutagenic effects in humans.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Trichloroethylene (79-01-6)	No	Yes	2A

---

12. Ecological Information

Environmental Fate:

When released into the soil, this material may leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. This material has an experimentally-determined bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.

Environmental Toxicity:

The LC50/96-hour values for fish are between 10 and 100 mg/l. This material is expected to be slightly toxic to aquatic life.

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13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1710
Packing Group: III
Information reported for product/size: 5GL

International (Water, I.M.O.)

Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1710
Packing Group: III
Information reported for product/size: 5GL

International (Air, I.C.A.O.)

Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1710
Packing Group: III
Information reported for product/size: 5GL

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Trichloroethylene (79-01-6)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Trichloroethylene (79-01-6)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Trichloroethylene (79-01-6)	No	No	Yes	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Trichloroethylene (79-01-6)	100	U228	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: No information found.
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

6. Other Information

NFPA Ratings: Health: 2 Flammability: 1 Reactivity: 0
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep away from heat and flame.
Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician. Note to physician: Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 8, 11.
Disclaimer:
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Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

ALCONOX(R)

MSDS Number: A2052 --- *Effective Date: 02/21/00*

1. Product Identification

Synonyms: Proprietary blend of sodium linear alkylaryl sulfonate, alcohol sulfate, phosphates, and carbonates.
CAS No.: Not applicable.
Molecular Weight: Not applicable to mixtures.
Chemical Formula: Not applicable to mixtures.
Product Codes: A461

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Alconox(R) proprietary detergent mixture	N/A	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
May cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath.
Ingestion:
May cause irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.
Skin Contact:
No adverse effects expected.
Eye Contact:
May cause irritation, redness and pain.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

4. First Aid Measures

Inhalation:
Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact:
Wash exposed area with soap and water. Get medical advice if irritation develops.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Not expected to be a fire hazard.
Explosion:
No information found.
Fire Extinguishing Media:
Dry chemical, foam, water or carbon dioxide.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. When mixed with water, material foams profusely. Small amounts of residue may be flushed to sewer with plenty of water.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Moisture may cause material to cake. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for

the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
- OSHA Permissible Exposure Limit (PEL):
15 mg/m3 total dust, 5 mg/m3 respirable fraction for nuisance dusts.
- ACGIH Threshold Limit Value (TLV):
10 mg/m3 total dust containing no asbestos and < 1% crystalline silica for Particulates Not Otherwise Classified (PNOC).

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear protective gloves and clean body-covering clothing.

Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
White powder interspersed with cream colored flakes.

Odor:
No information found.

Solubility:
Moderate (1-10%)

Specific Gravity:
No information found.

pH:
No information found.

% Volatiles by volume @ 21C (70F):
0

Boiling Point:
No information found.

Melting Point:
No information found.

Vapor Density (Air=1):
No information found.

Vapor Pressure (mm Hg):
No information found.

Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
No information found.
Conditions to Avoid:
No information found.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Alconox(R) proprietary detergent mixture	No	No	None

12. Ecological Information

Environmental Fate:
This product is biodegradable.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Alconox(R) proprietary detergent mixture	Yes	No	No	No

--------\Chemical Inventory Status - Part 2\----------

	--Canada--

Ingredient	Korea	DSL	NDSL	Phil.
Alconox(R)	No	No	Yes	No
proprietary detergent mixture				

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Alconox(R)	No	No	No	No
proprietary detergent mixture				

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Alconox(R)	No	No	No
proprietary detergent mixture			

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: No information found.
Poison Schedule: No information found.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **0** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.
Label Precautions:
Avoid contact with eyes.
Keep container closed.
Use with adequate ventilation.
Avoid breathing dust.
Wash thoroughly after handling.
Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. In all cases, get medical attention.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16.
Disclaimer:
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Prepared by: Strategic Services Division
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MATERIAL SAFETY DATA SHEET

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SECTION 1 – PRODUCT INFORMATION

Chemical Family: Petroleum Hydrocarbons	**Trade Name: #137 Diesel Treat 2000**
Formula: Proprietary Mixture.	

SECTION 2 – HAZARDOUS INGREDIENTS

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES	CAS Number	%	Exposure Limits			
			TVL		PEL	
			ppm	mg/m³	ppm	mg/m³
Petroleum Distillate	68477-31-6	6-8		5		5
Naphthalene	91-20-3	.86	10	52	10	50
2-(Thiocyanomethylthio) Benzothiazole	21564-17-6	<1	NE		NE	
Heavy Aromatic Naphtha	64742-94-5	.2-1		5		5
2-Ethyl Hexyl Nitrate	27247-96-7	30-40	8			
Light Naphthenic Distillate	64742-53-6	25-30		5		5
Xylene	1330-20-7	.87	100	434	150	651

Section 3 – PHYSICAL DATA

Boiling Point:	300° F/148.8° C	**Specific Gravity:**	.9083
Vapor Pressure (mm, Hg):	<.1	**% Volatile:**	<15
Vapor Density (Air = 1):	Not Determined	**Evaporation Rate: (=1)**	Not Determined
Solubility in Water:	Disperses	**pH:**	Not Applicable
Appearance and Odor: Red color, slight aromatic odor.			

SECTION 4 – FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method) ° F/° C: 75° F/23.89° C PMCC	**Flammability Limits UEL & LEL** ---Not Determined
Extinguishing Media: Carbon dioxide foam, dry chemical foam, sand, earth, waterfog.	
Special Fire Fighting Procedures: For fires involving this material, do not enter any enclosed or confined space without protective equipment including self-contained breathing apparatus. Cool exposed containers with waterspray. Avoid breathing fumes.	
Unusual Fire & Explosion Hazards: This product is flammable.	

SECTION 5 - REACTIVITY HAZARD DATA

STABILITY [X] STABLE [ ]UNSTABLE	**Hazardous Decomposition** [ ] WILL [X] WILL NOT OCCUR
Conditions to Avoid: High heat, high energy ignition sources	
Incompatibility (Mat. to avoid): Strong oxidizing agents, amines, phenols, halogen compounds.	
Hazardous Decomposition Products: Oxides of carbon and nitrogen.	
Conditions to Avoid: None.	

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value and Sources: None established.
Acute Effects of Overexposure:
Ingestion: Harmful or fatal if swallowed.
Eye Contact: Liquid contact produces severe irritation to the eyes.
Skin Contact: Prolonged and repeated contact with the skin can cause redness or severe irritation.
Inhalation: Inhalation of vapors can cause headache, dizziness, nausea, or decreased blood pressure.
CHRONIC EFFECTS OF OVEREXPOSURE: None currently known.
Emergency and First Aid Procedures:
Swallowing: If a large amount of this material is swallowed give a large amount of water to drink. Do not induce vomiting. Seek medical attention immediately.
Skin: Wash skin thoroughly with soap and water. Launder contaminated clothing.
Inhalation: Remove victim to fresh air. If breathing has stopped start artificial respiration immediately.
Eyes: Flush eyes with clear, cool, clean water for 15 minutes. Seek medical attention immediately

SECTION 7 – SPILL OR LEAK PROCEDURES

Environmental Impact: This material is not expected to present any environmental problems other than those associated with il spills. If spilled into a watercourse, call the Coast Guard Toll Free No. 800-424-8802.

rocedures To Be Taken If Material Is Released or Spilled: Eliminate all sources of ignition. Absorb spills with absorbent clay. Ventilate confined spaces. Keep out of sewers and watercourses.

Waste Disposal Method: Dispose of at an approved waste or disposal site facility in accordance with all applicable federal, tate and local laws and regulations.

SECTION 8 – SPECIAL PROTECTION INFORMATION

?espiratory Protection: None required under ordinary conditions of use.

/entilation: No special requirement under ordinary conditions of use and with adequate ventilation.

Eye Protection: Goggles of face shield.

?rotective Clothing: Use air-supplied mask if used in confined space.

SECTION 9 – SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling and Storage: Do not store near heat, spark, flame or strong oxidizers. Keep :ontainers closed when not in use.

Special Comments: Avoid breathing vapors. Avoid prolonged or repeated skin contact. Remove contaminated shoes and clothing. Throw away shoes. Launder clothing before reuse. Wash thoroughly with soap and water after use.

SECTION 10 – ADDITIONAL HEALTH AND TOXICOLOGICAL DATA

HMIS & NFPA Ratings: Health = 2 Fire = 3 Reactivity = 0

:ontaminated clothing should be disposed of properly and/or decontaminated before reuse. Under no circumstance should vomiting be induced. Vomiting can cause aspiration of the product into the lungs. If aspirated into the lungs, chemical pneumonia, which may cause death in spite of treatment with oxygen and antibiotics, may result.

?robable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsion may be needed.

This product does not contain any levels of the chemicals that are listed as potential cancer causing agents as determined by he National Toxicology Program's Annual Reports, OSHA's Subpart Z list, the International Agency for Cancer Research's Monograph's or the State of California's Proposition 65 list.

:or SARA Title III Information, see below.

SARA TITLE III INFORMATION

Section 302/304 Extremely Hazardous

Component	CAS#	%	RQ (lbs.)	RQ (gal.)*
None				

Section 102(a) CERCLA Hazardous Substance

Component	CAS#	%	RQ (lbs.)	RQ (gals.)
Ethylbenzene	100-41-4	.02-.2	1000	66,138-661,376
Naphthalene	91-20-3	.86	100	1528
Xylene	1330-20-7	.87	1000	15,204

*Product RQ for Stationary Sources Release Regulatory.

Title Section 311 Hazardous Categorization

Acute	Chronic	Fire	Pressure	Reactivity
X	X	X		

Section 313 Toxic Chemical

Component	CAS#	%
Ethylbenzene	100-41-4	.02-.2
Naphthalene	91-20-3	.86
Xylene	1330-20-7	.87

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